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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/575,120

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Ryoji Nomura

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01/06/2010

COOK ALEX LTD

SUITE 2850

200 WEST ADAMS STREET

CHICAGO, IL 60606

EXAMINER

CROUSE, BRETT ALAN

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

01/06/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/575,120	Applicant(s) NOMURA ET AL.	
	Examiner Brett A. Crouse	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 3-5 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 6-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20090921;20060407</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Species I in the reply filed on 21 September 2009 is acknowledged.
2. The restriction requirement is withdrawn.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

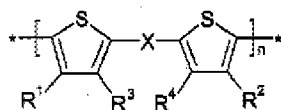
4. Claims 1, 2, 6, 7, 8, 9, 10, 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Heeney et al., EP 1,439,590.

Heeney teaches:

Paragraph [0102], teaches an electroluminescent device comprising mono-, oligo- or poly-mers of formula (I). The passage additionally teaches multilayer electroluminescent device structures comprising hole transport layer(s), electron transport layer(s) and emission layer(s) and applying a voltage across such a structure.

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Paragraphs [0026]-[0029], claim 1, formula (I), teach mono-, oligo- or poly-mers of formula (I), shown below, in the charge transport or electroluminescent layers of an organic light emitting diode. The mers of formula (I) can be used alone or in combination. X of formula (I) can be a substituted or unsubstituted arylene or heteroarylene group.



Paragraph [0079], teaches the compositions comprising mers of formula (I) can further comprise additional materials including electron acceptor materials.

Paragraphs [0028] [0030]-[0033], [0080], teach the use of the materials of formula (I) in displays and backlights.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

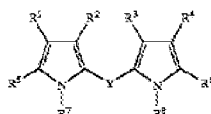
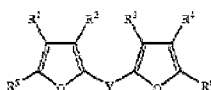
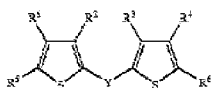
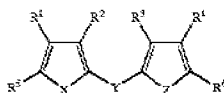
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-6, 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takasu et al., US 2004/0258954 in view of Heeney et al., EP 1,439,590 with further evidence provided by Angelopoulos et al., US 5,198,153.

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Takasu teaches:

Paragraphs [0025]-[0031], formulae 5,6,7,8, teach an electroluminescent device comprising a molecule represented by the formulae, shown below.



Paragraph [0032], teaches Y of the formulae represents an arylene group.

Paragraphs [0098], [0104], [0112], [0121], [0125], [0128], provide exemplified compounds in which further fused rings are formed from R^1 , R^2 and R^3 , R^4 .

Paragraph [0059], teaches various electroluminescent device structures. The passage additionally teaches the materials of the formulae can be used in the hole injection, hole transport, and luminescent layers of the device.

Paragraph [0061], teaches various materials suitable for use in the layers of the electroluminescent device.

Paragraphs [0067]-[0068], figures 2A, 2B, teach the use of the electroluminescent device as a pixel

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Paragraphs [0086]-[0089], teach the use of the electroluminescent device in various display applications including televisions, personal computers, and telephones.

Takasu does not teach:

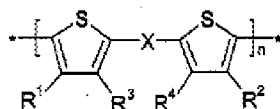
Takasu does not teach an electron acceptor as a dopant to the layer comprising the material of the formulae.

Takasu does not teach the use of the materials of the formulae in the electron transport/injection layers of an electroluminescent device.

Heeney teaches:

Paragraph [0102], teaches an electroluminescent device comprising mono-, oligo- or poly-mers of formula (I). The passage additionally teaches multilayer electroluminescent device structures comprising hole transport layer(s), electron transport layer(s) and emission layer(s) and applying a voltage across such a structure.

Paragraphs [0026]-[0029], [0080], claim 1, formula (I), teach mono-, oligo- or poly-mers of formula (I), shown below, in the charge transport, charge injection, or electroluminescent layers of an organic light emitting diode. The mers of formula (I) can be used alone or in combination. X of formula (I) can be a substituted or unsubstituted arylene or heteroarylene group.



Paragraphs [0077]-[0079], teaches the compositions comprising mers of formula (I) can further comprise additional materials including electron acceptor materials. The passage also incorporates by reference, Angelopoulos et al., US 5,198,153 in paragraph [0077].

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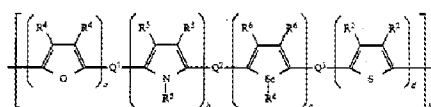
Paragraphs [0028] [0030]-[0033], [0080], teach the use of the materials of formula (I) in displays and backlights.

Angelopoulos as further evidence:

Angelopoulos is incorporated by reference into Heeney in paragraph [0077].

Column 17, lines 52-57, teach doped polymers can provide conductivity on the order of $10 \text{ ohm}^{-1} \text{ cm}^{-1}$.

Column 16, lines 8-24, formula, teach suitable (co)polymers include thiophenes, furans, pyrroles and combinations thereof. The formula is reproduced below.



It would have been obvious to one of ordinary skill in the art to use the doped thiophene, furan, and pyrrole (co)polymers as taught by Heeney in device of Takasu as charge transporting materials in the light emitting, hole injection/transport and electron injection/transport layers to provide high conductivity to the layer(s) of the device to improve device efficiency.

7. Claims 7, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takasu et al., US 2004/0258954 in view of Heeney et al., EP 1,439,590 with further evidence provided by Angelopoulos et al., US 5,198,153 as applied to claims 1-6, 9-14 above, and further in view of Hosokawa, US 2002/0045061.

The teachings of Takasu/Heeney as in the rejection above are relied upon.

Takasu/Heeney does not teach:

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Takasu does not teach an electron generation layer.

Hosokawa teaches:

Paragraphs [0109]-[0115], teach a hole barrier layer improves device performance by confining holes in the luminescence layer. The passage additionally provides a preferred composition of the hole barrier layer comprising BPhen or BCP in combination with Li or Cs.

Paragraph [0160], example 3, teaches 2,9-dimethyl-4,7-diphenyl-1,10-phenanthroline (Bathocuproine)(BCP) co-deposited with cesium in a hole barrier layer deposited upon the luminescent layer.

Paragraph [0103], teaches it is preferred to include a semiconductor layer having an electrical conductivity of at least 10^{-10} S/cm between the anode and light emitting layer.

It would have been obvious to one of ordinary skill in the art to use the hole barrier layer of Hosokawa in the device of Takasu to improve the hole confinement in the light emitting layer and improve device performance as suggested by Hosokawa.

It would have been obvious to one of ordinary skill in the art to include a layer of the doped material of Takasu/Heeney in the device of Takasu/Heeney between the anode and light emitting layer to provide a high conductivity layer to improve hole injection into the light emitting layer. Such a layer would be expected to meet the limitations of a electron generation layer as indicated on page 18 of the instant specification.

Contact Information

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brett A. Crouse whose telephone number is (571)-272-6494. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/B. A. C./
Examiner, Art Unit 1794

/D. Lawrence Tarazano/
Supervisory Patent Examiner, Art Unit
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